

arrangements for continuing these experiments at the Llwynpia Colliery of the Glamorgan Coal Company, where there is a large blower of natural gas.

On the subject of the other source of danger they make the following observations:—"The use of gunpowder and other explosives is at the present day so widely spread, and is held by many to be so indispensable, that all suggestions for checking their application in certain cases on account of risk need to be very carefully weighed." "An overwhelming majority of our witnesses assert that it is practically impossible, as a rule, to work mines without powder." They conclude however a review of the evidence on this subject with the following rather significant statement:—"In the meanwhile it has appeared to us to be desirable to make trials of such methods of 'falling' or bringing down the coal as may do away with the danger caused by sparks and flame; and with this view a series of experiments already commenced will be continued in different localities."

The result of these further inquiries and experiments with reference to lighting and blasting, it is of course impossible to forecast. We fear it would be rash even to hope for an announcement that for the future fiery seams may be worked with a light, and brought down by an explosive, neither of which can ignite an explosive mixture, and both of which can be readily adopted without adding to the cost of getting the coal. But we await with much interest the conclusion of an inquiry which has been conducted in such a thoroughly scientific manner, and upon which so much practical experience, time, and labour have been bestowed.

#### CELESTIAL OBJECTS FOR COMMON TELESCOPES

*Celestial Objects for Common Telescopes.* By the Rev. T. W. Webb, M.A., F.R.A.S. Fourth Edition, revised and greatly enlarged. (London: Longmans, Green, and Co., 1881.)

THIS is a new and much extended edition of a work which has attained considerable popularity amongst the many amateurs of astronomy in this country who are limited to the use of instruments of moderate optical capacity, or as the author terms them, "Common Telescopes." By this term are intended achromatics with aperture of from three to five inches, or reflectors of somewhat greater diameter, yet as telescopes of higher pretensions are now in the possession of private observers, the author in the selection of additional objects has aimed at including such as may be considered tests for a superior class of instrument. The increase in telescopic range applying chiefly to the sidereal branch of astronomy, the additions have been taken for the most part from the works of the Struves and Burnham for double stars, and Sir John Herschel's catalogue for nebulae: the total increase in the number of objects brought together in this new edition over the preceding one, is stated to be about 1500.

The first part of the work relates to the solar system, with a popular account of the actual state of our knowledge of the characteristics of its various members, so far as they fall within reach of moderate telescopes. In treating of the sun, the author collects many cases of the

observation of dark spots in motion upon the disk, including that recorded by Mr. Capel Lofft of Ipswich, in January, 1818, to which, if we mistake not, attention was first specially directed by Mr. Webb in an earlier edition of the present work. He reproduces Pastorff's drawings of what he supposed to be the great comet of 1819, in transit across the sun, on June 26, taken from the originals, which are in the possession of the Royal Astronomical Society. The *phosphorescence of the dark side of Venus*, a phenomenon not as yet satisfactorily explained, is dwelt upon, as also the problematical satellite assigned to this planet. The moon is the subject of detailed description, the peculiarities of her surface, and the various craters, walled plains, valleys, clefts or rills, annular mountains, &c., are brought together in an interesting form; a map of the lunar surface forms the frontispiece to the volume, and a full index to the five hundred spots marked upon it, with an "Alphabetical Table of Lunar Nomenclature," is amongst the contents: indeed our satellite forms the subject of special treatment, which is amongst the most notable and useful features of Mr. Webb's work. An outline chart of the surface of Mars follows, with the actual nomenclature, which we hope at no distant time to see placed upon a more satisfactory foundation. The principal points of interest furnished by telescopic observation of the disks of Jupiter and Saturn are referred to, though, from the limited space at disposal, in less detail than the reader might perhaps desire. Cases of visibility of the brighter satellites of Uranus, and the satellite of Neptune, with telescopes of moderate dimensions, are recorded.

After a brief notice of comets, the author passes to the main division of his work—sidereal astronomy, or, as he phrases it, "The Starry Heavens,—Double Stars, Clusters, and Nebulae." In this division, as it appears to us, Mr. Webb is at a disadvantage in being compelled to employ a system of abbreviation which, in the eyes of some readers, will not be without its disadvantage: but he has been perfectly aware of this, and in his Introduction asks the reader "to excuse a condensed form of expression, the result of necessity rather than of choice"; the amateur who intends to make practical use of the work must therefore accustom himself at the outset to Mr. Webb's abbreviations, and it must be admitted that it would have been difficult, without some such system, to have given the amount of information which is contained in the 300 pages or less, devoted to stellar astronomy. Mr. Webb follows the convenient plan of taking the constellations in alphabetical order, so far as they are visible in these latitudes: telescopic objects in the southern heavens are only noticed in a short appendix. The positions of the various objects are given to the nearest minute of time only in right ascension and the nearest minute in declination, but it may be remarked that the former is not a sufficiently close indication of the places of several interesting objects which fall well within the scope of observation of many amateurs, whom it might be desirable to enlist for their more systematic observation. We allude to cases like that of Tycho Brahe's star of 1572, Kepler's star of 1604, or Antheim's in 1670. For the former the author gives R.A. oh. 19m., Decl. 63° 24' N., and recommends that a minute star near the place should be watched; but any one acquainted with the neighbourhood will know that a

closer indication of its place is necessary for the identification of the suspicious object: it is the same with the small stars near the positions of Kepler's and Anthelm's stars. Variability has been remarked in small stars which occupy places very close to the observed positions of Tycho's and Anthelm's stars, and probably also in the case of Kepler's, and it is very desirable that a strict scrutiny of these spots should be maintained. As happens in so many popular treatises, there is a confusion in Mr. Webb's statement with regard to Kirch's variable star  $\chi$  Cygni (Bayer): the Greek letter is attached at p. 288 to the double star No. 2580 of Struve, and it is added, "About 4<sup>m</sup> f, 50's is 17, or  $\chi$  Bayer, discovered by Kirch; 1686, to be var., sometimes up to 5m," &c. It is, however, Flamsteed's 17 Cygni which corresponds to Struve's double-star, while the variable star is  $\chi$  Cygni of Bayer. Flamsteed, it is true, attached the letter  $\chi$  to his 17 Cygni, though, as was pointed out by Argelander many years since, through a mistake: he saw no other sufficiently bright star near the place to correspond to Bayer's, but the explanation of this circumstance is found in the fact that at the dates of Flamsteed's observations "the variable star was down," to borrow an expression with which observers of these objects will be familiar, so Flamsteed seized upon the nearest naked-eye star for Bayer's  $\chi$ . Mr. Webb dwells particularly upon the colours of the double-stars, one of their most interesting characteristics, and has brought together a large number of attractive notes upon the objects which he includes in his survey of the northern heavens. That his volume will maintain its popularity amongst amateur astronomers is not to be doubted, and we must add that it well deserves to do so.

#### CARNAC

*Excavations at Carnac.* By James Miln. (Edinburgh: Douglas, 1881.)

MR. MILN, to whom we are already indebted for a work on Roman remains found near Carnac (Britanny), has continued his researches in this interesting locality, and has given us a second work, consisting of a record of archæological researches in the alignments or stone avenues of Kermario.

The alignments of Kermario consist of ten rows of undressed stones, which extend for about two miles in an easterly direction, after which begin the avenues of Kerlescant. The stones, which consist of a close-grained granite, are some of them as much as twenty feet high, though the majority are much smaller. At the base of many of them Mr. Miln found ashes, charcoal, and fragments of pottery of a character which led him to the conclusion that these mysterious and almost unique avenues of stones were erected as sepulchral monuments. Although the whole monument is of such an extensive character, Mr. Miln is of opinion that it had not been completed. He draws this inference from the fact that in the neighbourhood he found several heaps of long stones, which he supposes had been brought there in order to be erected.

Among the stone avenues run certain ancient earthworks, and at the head of them are, as Mr. Miln found, the remains of ancient buildings. It was in these earthworks,

at the base of the menhirs (which however he was very careful not to overturn), and among the ruins of these buildings that Mr. Miln's excavations were carried on.

The principal interest of the objects discovered in his researches, is the evidence they afford as to the period at which these menhirs were erected, and Mr. Miln comes to the conclusion from the result of his investigations that between Kermario and Kerloquet we have a long stretch of defensive works erected by the Celts at a period anterior to the Roman invasion; that the Romans on their arrival had occupied some of these, and in the more advantageous positions had constructed other works of greater solidity. On the other hand there seems some evidence that the erection of standing stones or menhirs did not altogether cease at this period, for under some of them, and in positions which would seem to show clearly that they were placed there at the time the menhirs were erected, fragments of Roman tiles and pottery have been discovered. These menhirs, however, formed no part of the "alignments."

It is interesting that, as Dr. Closmadeuc had already pointed out, we have evidence that there has been a change in the level of the land since the erection of these monuments. Mr. Miln considers that nearly the whole, if not the whole, of the bay of Quiberon must then have been dry land. On the Quiberon side of the bay the rows of menhirs extend under water, and on the Carnac side too, Gallo-Roman potters' furnaces have been found below high-water mark.

We much regret to add that the author died the very day after he had finished the proof sheets of this work. The present writer had the pleasure of examining Mr. Miln's excavations with him in the autumn of 1877, and may be permitted to add his personal expression of regret at the loss which archæological science has experienced in his death.

#### OUR BOOK SHELF

*The Mind of Mencius.* By the Rev. E. Faber. Translated by the Rev. A. B. Hutchinson. (Trübner's Oriental Series. 1881.)

MR. FABER is already well known in the field of Chinese studies by his digest of the doctrines of Confucius. In the present volume he gives us a systematic digest of those of Mencius, the greatest and most popular of the disciples of Confucius. These two philosophers form the bulwarks of Chinese conservatism, against the doctrines of socialism and communism, which first thrust themselves into notice after the death of Confucius. These men, as the translator remarks, made no appeal to external credentials; they rather based the truth of their mission on the conformity of their doctrines with the essentials of the human mind, as shown by observation. To them the "state" is everything—it is "the sum of all human endeavours, natural and civilised, working together as a united organisation." For about 3000 years the political fabric of China, based on the principles of which Confucius and his disciples were the exponents rather than originators, has held together in spite of shocks before which any other system known in history would have disappeared, and at the present day seems as vital and vigorous as at any portion of its existence. To explain by the light of the best commentators what these principles, as enunciated by Mencius were, is the object of Mr. Faber. This philosopher was a contemporary of Plato and Aristotle, but his doctrines are still living and active principles in Chinese ethics and politics. The